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## *An affordable heating option for your home*

An air-source heat pump is an electrical device that can help reduce your home-heating costs and control humidity during summer. It transfers heat from one area to another by circulating a refrigerant between two heat exchanger coils. In one coil, the refrigerant is evaporated at low pressure and absorbs heat from the surrounding air. The refrigerant is then compressed as it moves to the other coil, where it is condensed at high pressure and releases the heat it absorbed earlier in the cycle.

An air-source heat pump can provide the following:

- heating in winter, by removing heat from the outside air and transferring it inside your home
- cooling in summer, by removing heat from the air inside your home and "dumping" it to the outdoors
- dehumidification in summer, by causing moisture in the air inside your home to condense on the heat pump's indoor coil, from where it is piped to a drain

## *Easy installation in new and existing homes*

A properly designed heat pump installation will meet most of your home-heating needs. However, when the outside air becomes very cold, the heat pump needs to be supplemented. For this reason, heat pumps are designed to work in conjunction with a backup heating system.

Three basic installation options are available:

- An "add-on" heat pump is designed to be used in conjunction with a separate, supplementary heating system, such as an oil or electric furnace. These installations are well suited to existing homes that already have a central furnace and duct system.
- An "all-electric" heat pump comes equipped with its own supplementary heating system in the form of electric-resistance heaters. These installations are a good choice for new home construction.
- A "mini-split" heat pump consists of a number of indoor heat-exchanger coils connected to a single outdoor unit. These installations can be an option for existing homes that have a hydronic or electric baseboard heating system.

Installation of an air-source heat pump can significantly reduce home-heating costs. For example, converting an electric furnace system to an all-electric air-source heat pump could reduce annual heating costs for a typical home by as much as 50 per cent.

## *Selecting an efficient heat pump*

The standard efficiency of air-source heat pumps is measured in HSPF (heating seasonal performance factor) in winter and SEER (seasonal energy efficiency ratio) in summer. The HSPF is a measure of the system's total heat output (in British thermal units, or Btu) over the entire heating season divided by the total energy (in watt-hours) it uses during that time. The SEER is a similar standard rating of the unit's cooling capacity during the summer months. In both cases, the higher the number, the more efficient the heat pump.

# Air-Source Heat Pumps

## *A Home-Heating Option for Atlantic Canada*



Canada

HSPF and SEER ratings are based on a standard set of climate conditions (Region V for Canada) and are useful in comparing one heat pump model to another.

Following is a simplified measure of heating performance in actual heat pump installations. The chart below provides typical *annual* average heating performance factors (in relation to standard-rating minimum, mid- and high-efficiency HSPFs) for heat pumps in the four Atlantic capitals.

These were calculated by modelling heat pump performance in a range of house sizes located in each city.<sup>1</sup> The higher the number, the lower the home-heating costs will be. The heating systems in these model homes were all-electric heat pumps, and the calculations included the energy consumed by the backup heating system.

*Typical Heat Pump Annual Heating Performance Factors\**

City	HSPF 5.9*	HSPF 7.0*	HSPF 7.8*
Charlottetown	1.6	1.8	1.9
Fredericton	1.6	1.6	1.8
Halifax	1.8	2.0	2.2
St. John's	1.9	2.1	2.4

\* as rated for Region V

Calculate the energy savings of a heat pump by dividing your current energy consumption for heating by the appropriate annual performance factor; e.g. a home using 10 000 kWh/yr for heating, when equipped with a heat pump having an annual performance factor of 2.0 will consume 5 000 kWh/yr ( $10\,000 \div 2 = 5\,000$ ).

<sup>1</sup> These figures are provided for the purpose of calculating estimated energy savings of a heat pump and may not necessarily reflect savings achieved in actual installations. Please contact your heating contractor or utility for more information.

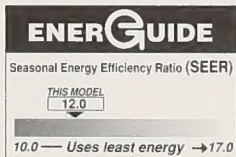
## Canada's new HVAC rating system

Heat pumps are among more than 20 other energy-using products whose minimum energy efficiencies are regulated under the Canadian *Energy Efficiency Regulations*. These Regulations apply to heat pumps that are imported into Canada or shipped between provinces. Some provincial governments also regulate minimum energy efficiency standards for heat pumps.

The Heating, Refrigerating and Air Conditioning Institute of Canada (HRAI) has collaborated with Natural Resources Canada (NRCAN) to develop a national energy efficiency rating system for heat pumps and other heating, ventilating and air conditioning (HVAC) equipment. The rating system helps consumers identify and purchase the most energy-efficient products available on the market.

The program uses the SEER rating to compare the energy efficiency of different heat pump models. When purchasing a heat pump, check the manufacturer's literature for the EnerGuide label shown below (all product brochures should feature the EnerGuide rating by January 1997) and compare SEERs, particularly if you intend to use the heat pump as an air conditioner.

*As well, be sure to compare HSPFs and COPs for different models, since providing space-heating (as opposed to cooling) is generally the primary motivation for installing a heat pump in Atlantic Canada.*



## Team HVAC

"Team HVAC" is a voluntary alliance of organizations that is working to raise consumer awareness of the economic and environmental benefits of using energy-efficient air-to-air heat pumps, residential gas furnaces and central air conditioners. Members include NRCAN, HRAI, HVAC manufacturers and their dealers, and Canadian energy utilities—including Nova Scotia Power Incorporated and Newfoundland Power.

The "Team HVAC" logo is a symbol of commitment to energy efficiency. Look for this logo in store windows and on product literature to ensure that the manufacturer is a registered member of "Team HVAC."

**ENERGUIDE** L'équipe CVC  
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*For more information...*

Natural Resources Canada has published a booklet entitled *Heating and Cooling With a Heat Pump*. For a free copy of this publication, write to

**Energy Publications**  
c/o Canada Communication Group  
Ottawa, Ontario  
K1A 0S9

or call NRCAN's toll-free publication line at  
**1-800-387-2000**

More information on "Team HVAC" is available on the Internet at  
<http://ceb-dec.nrcan.gc.ca/HVAC>

